



AMENDMENT

Please enter the following amendments:

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IN THE CLAIMS

Cancel claims 1-6, 15 and 22 without prejudice or disclaimer.

Please amend claims 16, 21 and 23 as follows:

5 16. (Twice Amended) A method of carbon monoxide hydrogenation comprising:

(a) providing a catalyst structure in a reactor, wherein the catalyst structure comprises a porous structure having a catalyst thereon, wherein the catalyst structure comprises a pore size of at least 0.1 μm , and wherein the catalyst structure comprises a foam, felt, wad, or combination thereof;

(b) passing a feed stream comprising carbon monoxide gas and hydrogen gas through the catalyst structure; and

(c) heating the catalyst structure to at least 200°C;

wherein the feed stream has a residence time in the reactor of less than five seconds; and

wherein a product stream is obtained that exhibits the properties of at least a 25%

conversion of carbon monoxide and at most 25% selectivity toward methane.

10 21. (Amended) 9. The method of claim 20 wherein the metal foam has pores that range from 20 pores per inch to 1000 pores per inch.

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(Amended)

The method of claim 35 further comprising a catalyst layer

deposited on the interfacial layer.

Please add claims 25-45 as follows:

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The method of claim 10 wherein the porous support has 80 to 1000 pores per inch.

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The method of claim 10 wherein the feed stream follows a tortuous flow path through the catalyst structure.

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The method of claim 10 wherein the porous support has 80 to 1000 pores per inch.

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The method of claim 10 wherein the interfacial layer is continuous over the first pore surface area.

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The method of claim 10 wherein the residence time is from 1 to 2 seconds.

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The method of claim 10 further comprising a catalyst layer deposited on the interfacial layer.

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The method of claim 10 wherein the interfacial layer is continuous over the first

pore surface area.

~~18~~⁵
~~32~~ The method of claim ~~32~~⁵ wherein the ratio of hydrogen to carbon monoxide ranges from 1.5:1 to 3.5:1.

~~19~~⁵
~~33~~ The method of claim ~~16~~⁵ wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in decreasing methane selectivity.

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1.126
~~20~~⁵
~~33~~ The method of claim ~~16~~⁵ wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in increasing conversion %.

~~21~~¹²
~~34~~ The method of claim ~~26~~¹² wherein decreasing the pressure at the same temperature and pressure corrected residence time, results in increasing conversion %.

~~22~~⁵
~~35~~ The method of claim ~~16~~⁵ wherein an interfacial layer is disposed on the porous structure, wherein the porous structure has a pore size greater than 0.1 μm , and wherein the interfacial layer has a pore size less than that of the porous structure.

~~23~~²²
~~36~~ The method of claim ~~35~~²² wherein the porous structure is a coherent structure.

~~24~~³⁷
~~37~~ A method of carbon monoxide hydrogenation comprising:

(a) providing a catalyst structure in a reactor, wherein the catalyst structure comprises a

porous structure and a porous interfacial layer disposed on the porous structure, wherein the porous structure has a first pore size of at least 0.1 μm , wherein the porous interfacial layer has a second pore size less than the first pore size;

(b) passing a feedstream comprising carbon monoxide gas and hydrogen gas through the catalyst structure; and

(c) heating the catalyst structure to at least 200°C;

wherein the feedstream has a residence time in the reactor of less than five seconds; and

wherein a product stream is obtained that exhibits the properties of at least a 25% conversion of carbon monoxide and at most 25% selectivity toward methane.

~~25~~
~~37~~ 38. The method of claim ~~24~~ 37 wherein the feedstream follows a tortuous flow path as it passes through the catalyst structure.

~~26~~
~~39~~ 39. The method of claim ~~25~~ 38 wherein the interfacial layer is continuous.

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~~40~~ 40. The method of claim ~~25~~ 38 wherein the residence time is from 1 to 2 seconds.

~~28~~
~~41~~ 41. The method of claim ~~25~~ 38 wherein the porous structure comprises a foam or felt.

~~29~~
~~42~~ 42. The method of claim ~~28~~ 41 wherein the foam, felt or wad has 80 to 1000 pores per inch.